

EXPLANATION OF SIGNIFICANT DIFFERENCES

FOR THE

BOOMSNUB/AIRCO SUPERFUND SITE
HAZEL DELL, WASHINGTON

CLARK COUNTY

September 2015

EXPLANATION OF SIGNIFICANT DIFFERENCES

Boomsnub/Airco
Hazel Dell, Washington
CERCLIS ID # WAD009624453

INTRODUCTION AND STATEMENT OF PURPOSE

The U.S. Environmental Protection Agency (EPA) is issuing this Explanation of Significant Differences (ESD) to document a modification to EPA's February 2000 Record of Decision (ROD), which selected the final remedial actions for the Boomsnub/Airco NPL Site. This is the second ESD for the site. The first ESD was approved and implemented in 2006.

Because the Site-wide groundwater remediation has been operating for about 20 years, EPA has a better understanding of how best to implement the groundwater cleanup and achieve cleanup objectives and cleanup levels. This ESD makes the following change to the final remedy:

Use of in-situ (in-place) treatments for groundwater and soil remediation to supplement the groundwater extraction and treatment system and improve remediation in areas where the extraction system is less effective at contaminant removal. Such treatments will be used in areas of residual contamination along with groundwater extraction and treatment, to accelerate and complete the Site cleanup.

STATUTORY AUTHORITY

EPA is issuing this ESD in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Section 117(c), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Section 300.435(c)(2)(i), which authorize changes to the selected remedial action after the issuance of a Record of Decision (ROD). This ESD is supported by an Administrative Record.

The Administrative Record for this ESD is available for review at the Superfund Records Center, EPA Region 10, 1200 Sixth Avenue, Seattle Washington.

SITE HISTORY, CONTAMINATION, AND SELECTED REMEDY

Background

The Boomsnub/Airco Superfund Site (Site) consists primarily of two properties (the former Boomsnub chrome-plating facility and the active Linde gas separation facility), and a plume of contaminated groundwater in the alluvial aquifer that at one time extended approximately 4,400 feet west/northwest from the properties. The Site is bordered by a mixture of residential, commercial, and light industrial properties. Groundwater in the deeper Troutdale aquifer is used for drinking water. The nearest down gradient production water supply well is located about one mile west of the Boomsnub/Linde properties.

The Boomsnub Corporation and its predecessor company, Pioneer Plating, conducted chrome-plating operations on the Boomsnub property from 1967 until 1994, when Boomsnub moved its business to a new location. Leaks and spills from chrome-plating operations contaminated soil and groundwater on the Boomsnub property and three adjacent properties. Linde, also formerly known as Airco and BOC Gases, owns and operates an 11-acre facility that manufactures compressed and liquefied gas products including nitrogen, oxygen, and argon. The Linde plant has been in operation since 1964. Volatile organic compounds (VOCs) leaked or spilled onto the ground or into dry wells on Linde property and have contaminated the unconfined alluvial aquifer. Contamination has not reached the underlying Upper Troutdale Formation aquifer, which is the principal water supply source in Clark County, WA.

Extraction and treatment of contaminated ground water began in May 1990. The Site was placed on the National Priorities List (NPL) in April 1995 at the request of the Washington Department of Ecology (Ecology). In 1994, Linde assumed responsibility for the VOC portion of the groundwater treatment system. Linde assumed lead responsibility for operation and maintenance of the entire groundwater extraction and treatment system, for both VOC and dissolved metals, in April 2002.

Operable Units

EPA divided the Site into three operable units (OUs) to manage cleanup activities:

- OU1 - Boomsnub Soil
- OU2 - BOC Soil
- OU3 - Site-Wide Groundwater

These OUs have been addressed through time-critical and non-time critical removal actions, the September 1997 Interim ROD, the February 2000 final ROD, the September 2000 Action Memorandum, and the June 2007 Consent Decree. The remedial construction at OU-1 is largely completed, except for contaminated soil beneath the treatment plant. This layer of soil will be excavated when the groundwater treatment system is removed upon completion of the remedial action for groundwater. OU-2

focused on *in-situ* remediation of the OU-2 VOC source area using an in-well stripping/soil vapor extraction system which became operational in February 2004. The soil vapor extraction system was operated until 2008, when it had completed removal of VOCs from the vadose zone. The in-well stripping system continues to operate, but has reached the point where further contaminant removal is minimal (asymptotic conditions). OU-3 includes an extensive Site-wide groundwater extraction and treatment system that began as part of initial removal actions at the Site and that was included in both the interim and final RODs. Currently this system includes 16 active extraction wells and approximately two miles of piping to bring the untreated extracted groundwater to the water treatment plant that is located on the Boomsnub property. Treated groundwater was discharged to the Vancouver municipal wastewater treatment facility until 2006, when discharge was redirected to a newly constructed infiltration gallery on the Linde property. There are approximately 75 wells currently used for monitoring these remedial actions, as shown on Figure 1.

This ESD adds an additional component to the remedial action selected in the 2000 final ROD for OU-3. The current extraction and treatment system has significantly reduced plume contaminant concentrations and the areal extent of contamination as documented in annual reports, and shown in Figures 2 and 3. As a result, the continued operation of the groundwater extraction and treatment system, as modified by this ESD, combined with source control components are expected to meet the Remedial Action Objectives (RAOs) and cleanup levels identified in the 2000 ROD.

Remedial Action Objectives and Selected Remedy for Site-Wide Groundwater (OU-3) in the 2000 ROD

In the ROD, EPA established the following RAOs for groundwater:

- Prevent further impacts to the alluvial aquifer
- Restore impacted groundwater to drinking water standards (Maximum Contaminant Levels (MCLs) or Model Toxics Control Act (MTCA) Method B standards)
- Prevent ingestion of contaminated groundwater above federal and state drinking water standards
- Prevent impacts to the Upper Troutdale Aquifer and the public drinking water supply by reducing contamination in the alluvial aquifer

These RAOs were to be accomplished through completion of the following actions as established in the ROD:

1. Upgrade the existing ion-exchange and air stripper for *ex situ* groundwater treatment by increasing the capacity of the ground water treatment system, including increasing the capacity of the conveyance pipe and discharge

pipeline from 100 gallons per minute (gpm) to a minimum 200 gpm capacity.

2. Improve the treatment building and other structural facilities to prevent wear and tear on the treatment system and allow for necessary expansion.
3. Continue pumping from the existing 21 extraction wells or some combination of these wells, adding new wells as needed to optimize the removal and treatment of contaminants.
4. Conduct long-term compliance monitoring bi-annually in the alluvial and Upper Troutdale aquifers using existing monitoring wells, and new wells as necessary, to determine the effectiveness of the selected remedy in achieving the remedial action objectives. The frequency of compliance monitoring for the area of attainment and points of compliance may be modified by EPA as appropriate. Cleanup levels for VOCs and metals were established in the ROD.
5. Provide institutional controls in the form of public notice during operation of the groundwater pump and treat system, accomplished by providing affected property owners a copy of biannual groundwater quality sampling data for their property for all contaminants exceeding cleanup standards.
6. Discharge treated water to the City of Vancouver POTW in compliance with a permit. EPA may evaluate discharging treated groundwater to the infiltration gallery on the Boomsnub property after source control actions up-gradient at the BOC property are in place.
7. Wastes from ion exchange resin will be disposed at an appropriate RCRA Subtitle D or C landfill, and wastes from the granular activated carbon will be sent off-site for treatment/regeneration.
8. Evaluate the effectiveness of the *ex situ* groundwater treatment system no less than every five years until monitoring demonstrates that remedial action objectives have been achieved. At each five-year review, EPA will reevaluate available literature on the permeable reactive barrier technology to see if it has proven to be a reliable long-term technology at other similar sites.
9. Develop as part of remedial design, an extended in-well stripping treatability test for a 12- to 18-month duration for potential use throughout the plume, either for VOCs alone or for VOCs and chromium, as appropriate depending on treatability results.

The remedy includes groundwater treatment for an estimated 30 years from the time the ROD was signed, during which time the system's performance is to be carefully

monitored and optimized on a regular basis and adjusted as warranted by the performance data collected during operation. Modifications are to be implemented in a way that accommodates changing land uses and other types of activity.

The 2000 ROD requirement to provide affected property owners with information about the quality of groundwater beneath their property has been met, and exceeded by institutional controls on eight of 11 properties with remaining contaminated groundwater. These eight properties each have a notarized "Easement Agreement and Restrictive Covenant Regarding Environmental Remediation" by which the Grantor covenants not to install wells or use groundwater for potable purposes. All 11 properties beneath the current footprint of the Chromium and TCE plumes are served by a public water system, including the three properties without a restrictive covenant.

2006 Explanation of Significant Differences (ESD)

In August 2006, an ESD was prepared which documented several previous modifications to EPA's 2000 ROD. The 2006 ESD made the following changes to the final remedy:

1. Revised the required pumping rate capacity for the groundwater extraction and treatment system from a minimum capacity of 200 gallons per minute (GPM) to a maximum capacity of 160 GPM.
2. Upgraded both the ion-exchange system and the air-stripping unit at the groundwater treatment plant to improve contaminant removal, rather than upgrading the units for increased treatment volume.
3. Allowed treated groundwater to be discharged either to the newly constructed infiltration gallery on the BOC property or to the Vancouver municipal wastewater treatment facility. Discharge of treated groundwater to the existing gallery on the Boomsnub property, as described in the ROD, may still occur after further reduction in VOCs in the source area and after approval by EPA.
4. Enhanced institutional control requirements to protect the remedy constructed at the Site.

The 2006 ESD also clarified the status of the in-well stripping treatment test. The EPA expanded treatability testing for both TCE and chromium via modified in-well stripping was discontinued for the site-wide groundwater operable unit. In-well stripping was, however, adopted as part of the source control actions for the BOC Soil OU.

BASIS FOR THE SIGNIFICANT DIFFERENCE

The groundwater extraction and treatment system has been operating for about 20 years. Information from monitoring the extraction and treatment system has demonstrated the success of this system in reducing the size of the plumes and in extracting significant masses of contaminants from the groundwater.

However, areas of recalcitrant contamination can occur where silt layers slowly diffuse contaminants once groundwater extraction ceases. Based upon pilot testing at the site, the use of in-situ treatment can effectively address these areas of residual contamination. Therefore, use of in-situ treatment is proposed to augment pump-and-treat to serve as a polishing step as needed to meet the groundwater restoration RAO.

DESCRIPTION OF THE SIGNIFICANT DIFFERENCE

This ESD modifies the following element of the selected remedy for OU-3. No other elements of the remedy are being changed, nor are the RAOs and cleanup levels identified in the 2000 ROD being changed.

Description of the change: Use in-situ (in place) treatment technology in addition to the groundwater extraction and treatment system to enhance the effectiveness of the selected remedy in achieving Site remediation goals. Injection of carbon and zero valent iron (ZVI) particles was anticipated in a Work Plan submitted by the responsible party, but other in-situ reagents may be used if approved by EPA. The ROD allows for continued pumping from extraction wells to remediate the Site. This ESD is allowing the addition of in-situ treatment for remediation of areas of residual contaminants where groundwater extraction and treatment is unable to further reduce contaminant concentrations, or where the use of in-situ treatment is desired to reduce the overall time frame for remediation.

Basis for and explanation of the change: The groundwater extraction and treatment system has been operating successfully since 1995. The system is optimized periodically to maximize contaminant removal while preventing further migration of the plume. Site monitoring data have documented significant reduction in contaminant (chromium and TCE) concentrations and areal extent, as shown in Figures 2 and 3.

While the existing remediation system is generally very successful in remediating the Site, several localized areas of contamination persist, or may be expected to persist, even with continued pumping. The use of in-situ treatment technology in these areas is expected to reduce contaminant concentrations in groundwater to below Site cleanup levels. In-situ treatments may also be useful to accelerate remediation in other areas of the plumes.

In 2006, a pilot test was performed in an area at the original toe of the groundwater contaminant plume where contaminants were no longer being effectively removed by the extraction system. An in-situ chemical treatment was performed in the localized area of residual contamination. The treatment product used introduces carbon and iron into the groundwater, which changes groundwater chemistry and converts the contaminants into non-toxic byproducts. Within three months of the in-situ chemical treatment, TCE and chromium concentrations in this area decreased below the Site cleanup levels. Concentrations have remained below the cleanup levels since the pilot test was completed nearly 10 years ago. This pilot test demonstrated the capability of the in situ treatment

technology to remediate both TCE and chromium at the Site, and to be an effective, rapid, and long term remediation method. Use of other in-situ remedies producing similar field conditions may also be considered for contaminant remediation.

The in-situ treatment pilot test was implemented by creating a treatment zone in the area of residual contamination by injecting the reagent into the subsurface in a grid pattern. Similar applications may make use of a linear series of wells or boreholes at or down gradient of the contaminant plume, creating the zone of treatment. During the pilot study, one treatment was sufficient to decrease concentrations to below Site cleanup levels. If used in areas with higher COC concentrations in groundwater, repeat treatments may be necessary.

ESTIMATED COST

The 2000 ROD estimated that operating the groundwater extraction and treatment system over a 30 year period would cost approximately \$14 million. The cost of the in-situ remedy component to augment the extraction and treatment system will depend upon how many areas of the plume are identified for treatment.

The estimated cost of a cluster of five injection points, located about 10 feet apart, is approximately \$100K. This cost estimate includes preliminary investigations, in-situ treatments, and the initial year of post-treatment sampling.

SUPPORT AGENCY COMMENTS

The Washington Department of Ecology has had an opportunity to review this ESD and supports this change to the remedy. The site is a responsible party lead and thus there is no expectation of State funding for future operation and maintenance costs as there would be at a fund-lead site.

PUBLIC PARTICIPATION

CERCLA's public participation requirements, which are described at 40 CFR 300.435(c)(2)(i), will be met through issuance of this ESD, making this ESD and supporting information available to the public in the administrative record, and publishing a notice of this ESD and the availability of the Administrative Record in a local newspaper.

STATUTORY DETERMINATIONS

The selected remedy, as modified by this ESD, remains protective of human health and the environment, complies with federal and state requirements as identified in the ROD and as modified by this ESD that are applicable or relevant and appropriate to the remedial action, is cost effective, and uses permanent solutions and alternative treatment technologies to the maximum extent practicable.

This remedy continues to satisfy the statutory preference for treatment as a principal element of the remedy. This remedy will not result in hazardous substances remaining on-site above levels that allow for unlimited use and unrestricted exposure. However, until the site has met unlimited use unlimited exposure an EPA policy review will be conducted every five years to ensure that the remedy continues to provide adequate protection of human health and the environment.

Cami Grandinetti
Cami Grandinetti, Program Manager
Remedial Cleanup Program
Office of Environmental Cleanup
EPA Region 10, Seattle, WA

9/30/15
Date

FIGURES

Figure 1: Extraction and Monitoring Well Groupings

Figure 2: Chromium Plume Comparison 1995 to 2014

Figure 3: TCE Plume Comparison 1995 to 2014

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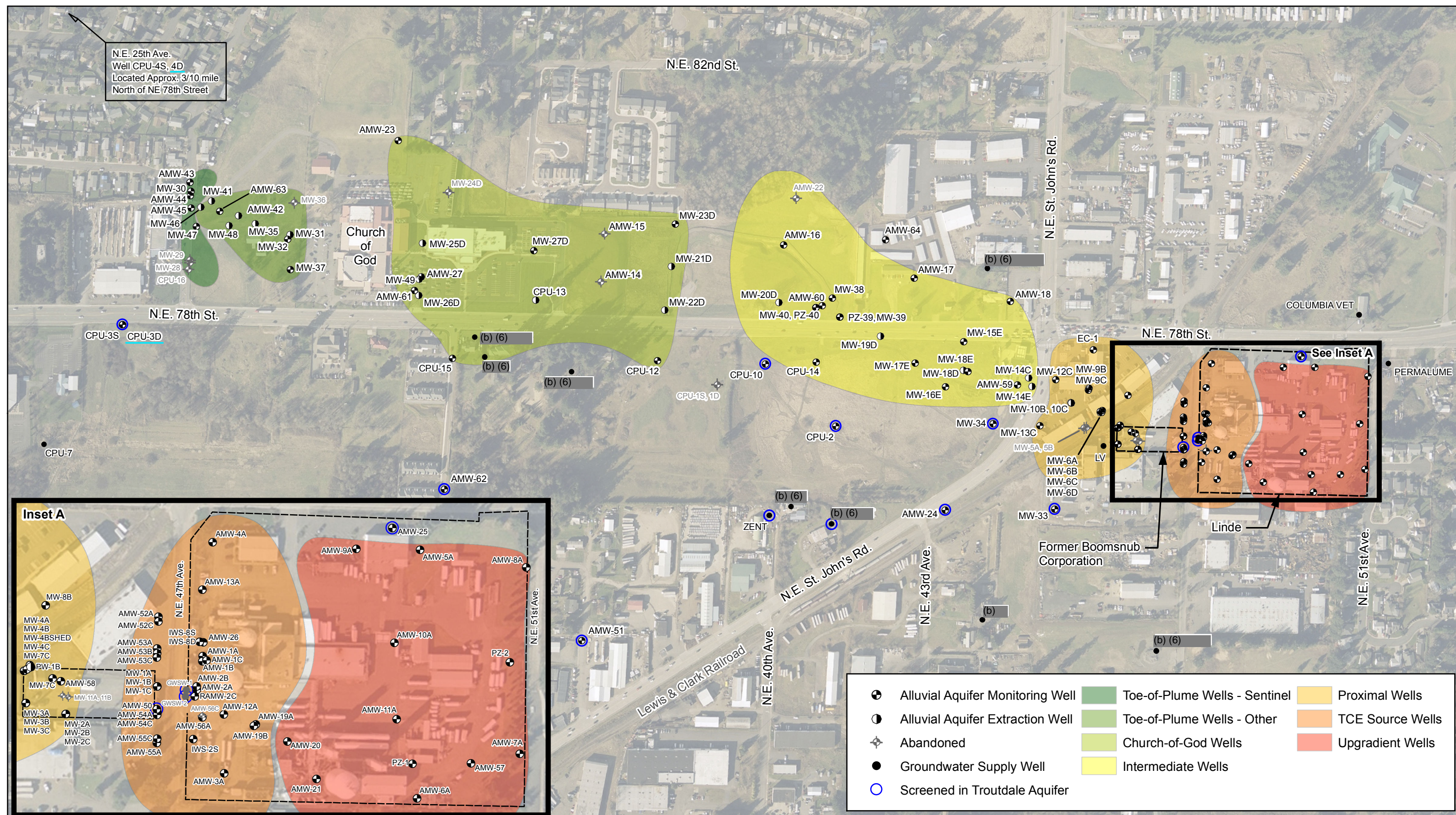
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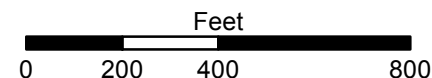
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EA Engineering, Science, & Technology, Inc.
720 Sixth Street South, Suite 100
Kirkland, WA 98033
Phone: (425) 451-7400
Fax: (425) 451-7800



BOOMSNUB / AIRCO SUPERFUND SITE HAZEL DELL, WASHINGTON

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FIGURE 1
EXTRACTION AND MONITORING WELL
GROUPINGS

